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EXAMINER	
LEUNG, JENNIFER A	

ART UNIT	PAPER NUMBER
1764	11

DATE MAILED: 07/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

A9-11

Office Action Summary	Application No.	Applicant(s)	
	09/522,118	HAM ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's Amendment submitted on April 28, 2003 has been received and carefully considered. The changes made to the Specification are acceptable. Claims 18 and 19 have been added. Claims 1-19 remain active.

Claim Objections

2. Claim 8 is objected to because the phrase "is inserted" (line 4) should be changed to -- are inserted -- for proper grammatical form. Appropriate correction is required.

Response to Arguments

3. Applicant's arguments filed on April 28, 2003 have been fully considered but they are not persuasive.

On page 9, beginning with line 18, Applicants assert,

> "The references, neither alone nor in combination, teach, show, or suggest a pair of generally radially extending side wall portions on at least some of said conduit members being angled away from each other in a generally radially outward direction but at an included angle which is less than if they were truly radial relative to the axis of the vessel."

However, the Examiner respectfully disagrees. As indicated in the prior Office Action, Koves discloses, "The distribution/collection conduits... can take on a variety of shapes. Conduits having rectangular, oblong, square or arcuate cross-sections can be used for fluid distribution or collection." (column 3, lines 52-56). Therefore, assuming *arguendo*, a rectangular conduit cross-section for the illustrated "scalloped" conduit members **58** cross-section, the rectangular shape inherently comprises the recited "pair of generally radially extending side wall portions", and upon positioning against the wall of a vessel, the side wall portions would inherently angle away

from each other in a generally radially outward direction, at an included angle which is less than if they were truly radial. The apparatus of Koves structurally reads on the claim limitation.

On page 9, beginning with line 23, Applicants further assert,

> "[T]he references, neither alone nor in combination, teach, show, or suggest inner wall portions of said conduit members having at least a portion of their surface formed by screen members which have flow openings which are of a dimension less than the diameter of the particulate material which forms a uniform thickness particulate bed and which is located in an annular space between the inner wall portions of the conduit members and the outer wall of the axially mounted member."

However, the Examiner again respectfully disagrees. As indicated in the prior Office Action, Koves disclose, "each conduit is perforated to communicate its interior with the particle bed - perforations are kept small enough to prevent migration of the particles into the scallops," (FIG. 1; column 4, lines 1-8). Therefore, the perforated wall portion of the conduit member of Koves structurally reads on the limitation of, "said conduit members having at least a portion of their surface formed by screen members which have flow openings which are of a dimension less than the diameter of the particulate material."

Regarding the combination of the Nagaoka reference, on page 9, beginning with line 15, Applicants assert,

> "Nagaoka discloses a device for holding catalyst in a radial flow reactor. Nagaoka is distinguishable in that the device is used to retain the catalyst, while the fluid conduit of the present invention and Koves does not."

However, please note that the cited passage in the Nagaoka reference (column 4, lines 9-32) refers to "prior art" radial flow reactors, such as those found in FIG. 10 and 11, and is merely presented to illustrate the conventionality of providing conduit members of a configuration capable of movement or removal, as necessitated during an installation or replacement operation.

In summary, Applicants arguments are not commensurate with the language of the

claims, since they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the recited claim limitations structurally distinguish over the stated prior art.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 5, 7-13, 16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975).

With respect to claim 1, Koves et al. disclose an apparatus comprising:

Inlet and outlet openings (nozzles **62, 72** respectively; FIG. 5; column 6, lines 40-51); wherein

- said inlet opening **62** is in communication with an annular space **52** defined on its outer side by the inner wall/interior wall **60** of the vessel and the outlet opening **72** is in communication with the interior of an axially mounted member **70** whose outer surface has openings therein which are smaller than the particulate material supported thereby (inherent of member **70**, which passes upward through outlet **72** the effluent vapor that has traversed the annular "catalyst particle retaining" space **52**, which is substantially of uniform radial thickness); and

An interrupted ring of separate, hollow conduit members **58** positioned against the inner wall **60** of the vessel and arranged in a vertical direction to fill said annular space **52** (FIG. 5, 6); wherein

- conduit members **58** inherently comprise an internal cross-sectional area formed by a pair of generally radially extending side wall portions and an inner wall portion, depending on the selected shape (i.e. conduit member **58** can take on a variety of shapes, such as

rectangular, oblong, square or arcuate; column 3, lines 52-56), said wall portions being integrally joined (FIGs. 1-3; column 3, lines 64-68);

- outer ends of the side wall portions (near knuckle sections **16**; FIG. 2) of adjacent conduit members **58** contact the inner wall **60** of the vessel (FIG. 6; column 7, lines 3-11); and
- inner wall portions of said conduit members **58** being permeable and having at least a portion of their surface formed by screen members that have flow openings (i.e. perforations) which are of a dimension less than the diameter of the particulate material (column 4, lines 1-8).

Although Koves et al. are expressly silent as to whether the side wall portions on at least some of said conduit members **58** are angled away from each other in a generally radially outward direction, with an included angle less than truly radial relative to the axis of the vessel, and whether the included angle is sufficiently small as to permit the individual conduit members to be moved inwardly relative to adjacent conduit members during an installation or replacement operation, such a configuration would be inherent of the conduit member, depending on which shape was selected. Furthermore, Koves et al. disclose, "Although there is usually provision for a sliding fit between the riser **68** (at the tope of the scallop) and cover plate **66**, frictional forces can restrict relative movement between the scallops **58** and vessel wall **60**," (column 6, lines 52-58). Therefore, the conduit members are admittedly capable of movement inwardly relative to adjacent conduit members. In addition, it would have been obvious to select a small included angle in order to facilitate easy removal of the conduit members, since as Nagaoka et al. cites, "...in radial flow reactors, it becomes necessary after running the reactor for a certain period of time to check a screen portion of the reactor and repair it if necessary," and "repair of the screen

portion is usually made outside of the radial flow reactor." (column 4, lines 9-32). In any event, it has been held that changes in size as well as changes in shape involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955), *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

With respect to claim 2, Koves et al. (FIG. 2; column 3, lines 58-64) further disclose the end portions (i.e. near knuckle sections **16**) of the side wall portions of each conduit member are joined by an outer wall portion (back side or section **14**).

With respect to claim 5, Koves et al. disclose that the conduit members may comprise a rectangular or square shape (column 3, lines 52-56), and thus inherently the inner wall portions are equidistant from the outer wall portions along their length.

With respect to claim 7, Koves et al. disclose the outer ends of said side wall portions which contact inner wall **60** are not joined to each other (FIG. 6; column 7, lines 23-26).

With respect to claim 8, Koves et al. are silent as to whether the conduits have a cross-sectional area and shape smaller than an opening in the top of the vessel, whereby individual conduits can be inserted or removed from the vessel. However, it would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the conduit members as such, since conduit members must be capable of being removed from the reactor in cases of repair (column 4, lines 9-32), as taught by Nagaoka et al. In addition, Nagaoka et al. teach a similar structure (catalyst container **4**; FIG. 1) which, like the conduit members above, require the capability of removal from the reactor. To facilitate removal, the container "... has a cross section of a size which enables the container to be carried in and out of the radial flow reactor through an opening formed in an upper or lower portion of the radial flow reactor," (column 5,

lines 23-40). In any event, it has been held that changes in size involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955).

With respect to claim 9, Koves et al. further disclose said ring of separate hollow conduit members **58** are slightly spaced from each other (FIG. 6) and that typically, during start-up, hot vapors contact the relatively thin conduits, which then expand at a different rate than the vessel wall (column 6, lines 58-66). Thus inherently, the spacing is sufficient to accommodate manufacturing tolerance or thermal expansion during operation of the vessel.

With respect to claim 10, Koves et al. disclose a spacing between conduit members, but are silent as to specifically a spacing distance of less than 2% of the distance between the outer ends of the side wall portions of each of said conduit members. In any event, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to adjust the distance between the conduit members to be as such, depending on the intended use of the apparatus and absent showing unexpected results, as it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*.

With respect to claim 11, Koves et al. are expressly silent as to adjacent conduit members having their pairs of side wall portions at different included angles. However, the included angles of the conduit members is inherent of the specific conduit shapes selected (column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to construct adjacent conduit members with side wall portions at different included angles, depending on the intended use of the apparatus and absent showing unexpected results. In addition, the use of different adjacent cross-sectional shapes, and

thus differing included angles, is a conventionally known design choice as evidenced by Nagaoka et al., who teach a structure similar in structure to the conduit members of Koves et al., wherein catalyst containers **34**, **35** (FIG. 8) having cross sectional shapes different from each other are arranged in combination to form a cylindrical catalyst bed (column 10, lines 20-24).

With respect to claim 12, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore inherently, the adjacent side wall portions of adjacent conduit members would be generally parallel to each other, depending on the specific shape selected. Furthermore, providing parallel side wall portions is a conventionally known design choice, as evidenced by Nagaoka et al., who teach structures **34** and **35**, as discussed in claim 11 above, comprising parallel side wall portions (FIG. 8).

With respect to claim 13, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide alternating conduit members having generally trapezoidal and generally rectangular cross-sections, depending on the intended use of the apparatus and absent showing unexpected results. Also, to further illustrate conventionality, the structures **34** and **35** of Nagaoka et al., as discussed in claim 11 above, comprise a combination of generally trapezoidal and rectangular cross-sectional shapes (FIG. 8).

With respect to claim 16, Koves et al. disclose the conduit members can take on a variety of shapes (column 3, lines 52-56), and therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide conduits having generally trapezoidal shaped cross-sections, depending on the intended use of the apparatus and absent showing unexpected results. Furthermore, it has been held that changes in shape

involves only ordinary skill in the art. *In re Dailey* 149 USPQ 47, 50 (CCPA 1966); *Glue Co. v Upton* 97 US 3, 24 (USSC 1878).

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claim 1 above, and further in view of Evans et al. (U.S. 5,118,419).

With respect to claim 3, Koves disclose the side wall portions and the outer wall portion of said conduit members are formed from a single sheet of material (FIG. 1-3; column 3, line 64-68). Koves are silent as to whether the material may comprise metal; however, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select metal as the material in the modified apparatus of Koves since the use of metal is conventionally known in the art, as evidenced by Evans, who cite, "typically, screen members... are produced by punching a large plurality of small oblong slots into a sheet of metal which is then formed and welded into the desired generally tubular shape," (column 1, lines 38-42).

With respect to claim 4, Koves are silent as to whether said screen members comprise parallel wires spaced to form slots. Evans et al. teach the use of screen members for radial flow applications (FIG. 4; column 1, lines 10-37), wherein the screen members comprise parallel wires **30** spaced to form slots **34**, said parallel wires typically being arranged in a vertical direction (FIG. 3A; column 6, lines 55-63). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify the screen members in the modified apparatus of Koves et al. to comprise parallel spaced wires, because the wires allow "the formation of slot widths for flow which are much smaller for a given strength of screen than is possible with the perforated plate type scallop [or conduit member]," as taught by Evans et al.

(column 6, line 65 to column 7, line 2).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claim 1 above, and further in view of Schuurman (U.S. 4,540,547).

Koves are silent as to said screen members being retained between flange portions extending from each of said side wall portions and an angle member fixed to said side wall portions. Schuurman teaches conduit members (segments **12**; FIG. 3, 5; column 3, lines 21-61; column 5, lines 12-14) comprising screen members (framework **13** formed by bars **14** and **15**; FIG. 2) retained between angle members **33** (column 4, lines 41-46) fixed to the side wall portions of the conduit members. It would have been obvious for one of ordinary skill in the art at the time the invention was made to construct the screen members in the modified apparatus of Koves according to Schuurman because constructing the members as such provides ease of manufacture (column 2, lines 11-16). Although Koves and Schuurman are collectively silent as to attachment of the screen member to the side wall portions via a flange portion, the use of flanges as a means for attachment is conventionally known in the art and therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide such to the side walls in the modified apparatus of Koves et al. in order to enable attachment (i.e., via conventionally known methods such as welding) of the screen member.

7. Claims 14-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koves et al. (U.S. 5,209,908) in view of Nagaoka (EP 0 483 975), as applied to claims 1, 9, 11-13 and 16 above, and further in view of Farnham (U.S. 4,374,094).

Koves et al. are silent as to a sealing plate being attached to said conduit members to

prevent particulate material from moving into the space between adjacent conduit members. Farnham (FIG. 2; column 5, lines 16-21) teaches a radial flow reactor comprising conduit members (scallops **19**) and a retainer screen means **22**, which extends over the side edges of adjacent conduit members and inherently acts as a "sealing plate" by retaining particulate material and thus preventing movement of particulate material into the space between adjacent conduit members. In FIG. 2, the retainer screen means **22** is attached to the edges of to the conduit members or scallops **19**. It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a "sealing plate" to the modified apparatus of Koves et al. because the plate would provide for radial and longitudinal uniformity of flow through the entire catalyst bed, as taught by Farnham (column 2, lines 11-31). Although Farnham does not specifically teach the mode of attachment of the retainer screen means **22** to the conduit members or scallops **19** -- in particular, attachment to specific side edges of the inner wall portion of specific conduit members (i.e. generally rectangular or trapezoidal members in the modified apparatus) -- it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select a particular attachment point for the plate based on intended use of the modified apparatus, absent showing unexpected results.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung
July 8, 2003 JAL

Hien Tran

HIEN TRAN
PRIMARY EXAMINER